

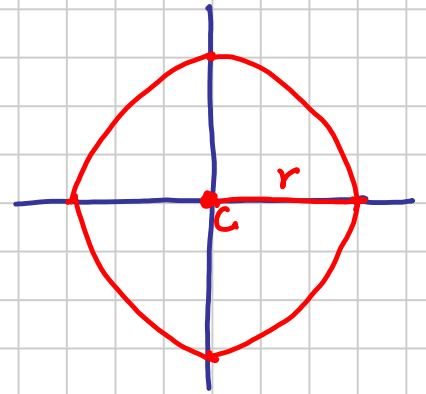
# Conic Section Cheat Sheet

Note Title

## Circles

Center @ Origin:  $x^2 + y^2 = r^2$

center @  $(h, k)$ :  $(x-h)^2 + (y-k)^2 = r^2$



## Ellipses

$$a > b$$

$$c^2 = a^2 - b^2$$

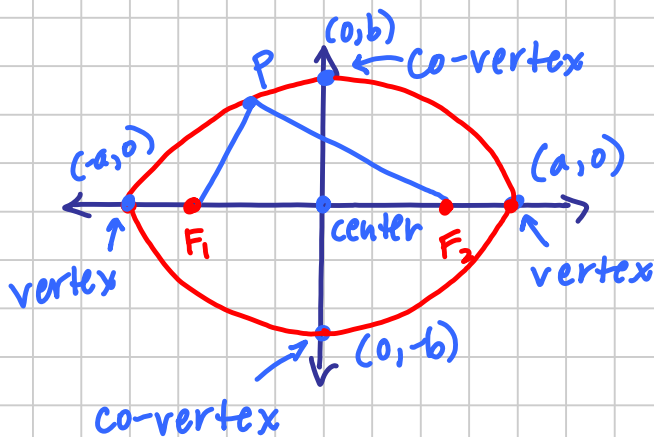
Center @ Origin:

horizontal:  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

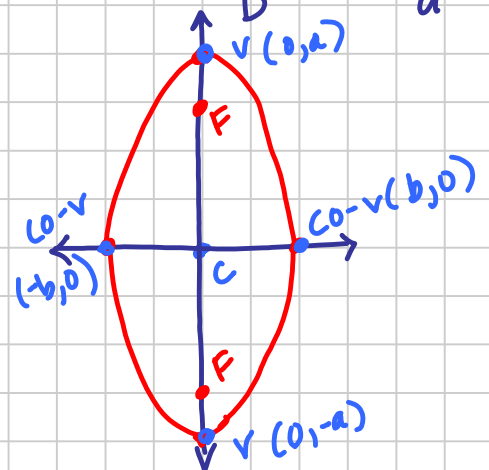
vertical:  $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$

center @  $(h, k)$ :

horizontal:  $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$       vertical:  $\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$



$c$  = dist. from center to focus



# Hyperbolas

$$c^2 = a^2 + b^2$$

center @ origin :

Horizontal:  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$       Vertical:  $\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$

center @  $(h, k)$ :

Horizontal:  $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$       Vertical:  $\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$

$$m = \pm \frac{b}{a}$$

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asymptotes:

$$y - y_1 = m(x - x_1)$$

Center  $(x_1, y_1)$

$a$  = dist. from center to vertex

$c$  = dist. from center to focus

